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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/926,213	09/25/2001	Shoji Nakayama	213896US2	8484

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EXAMINER	
ZIMMERMAN, GLENN	
ART UNIT	**PAPER NUMBER**
2879	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Offic Action Summary	Application No.	Applicant(s)	
	09/926,213	NAKAYAMA ET AL.	
	Examiner	Art Unit	
	Glenn Zimmerman	2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period f r Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 2 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 June 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,8-16,18 and 37-49* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8-13, 15,16,18 and 37-47 and 49* is/are rejected.

7)☒ Claim(s) *2, 14, 37, 38 and 40-49* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Amendment

Amendment, filed on June 13, 2003, has been entered and acknowledged by the examiner.

Claim Objections

Claims 2, 37, 38 and 40-49 are objected to because of the following informalities: The examiner notes that the applicant often shifts between using the wording "face plate" and "faceplate". From looking in the specification the term used there is "faceplate". The examiner suggests replacing all uses of "face plate" in the claims to - - faceplate - -. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-6, 8-13, 15, 18, 37-47 and 49 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ono et al. U.S. Patent 5,936,342 in view of Osamu et al. Japanese Patent Application Publicaton 08-022785.

Regarding claims 1 and 18, Ono et al. teaches a method of manufacturing a flat panel display comprising a metal back layer **(metal back Fig. 1 ref. 8)** on a faceplate having a phosphor layer **(fluorescent film ref. 7)** formed on a substrate (**glass substrate ref. 6)**; depositing a getter film made of evaporable getter material **(getter layer ref. 9; col. 8 lines 56-59; vacuum deposition; Ti is a known evaporable getter)** on the metal back layer on the phosphor layer disposing the faceplate thereon the getter film is deposited and a rear plate **(rear plate ref. 2)** having an electron source **(electron source ref. 2)** formed on a substrate **(soda line glass plate; col. 24 lines 45-46)** so as to face to each other to form a gap **(Fig. 1 no ref. #)** therebetween and hermetically sealing the gap **(col. 17 line 37)**, but fails to teach depositing the getter film without exposing the getter film to an oxidizing atmosphere. Osamu et al. in the analogous art teaches depositing the getter film without exposing the getter film to an oxidizing atmosphere **(paragraph 47 and 32 10-8 Torr)**. Additionally, Osamu et al. teaches incorporation of such a getter film which is not exposed to an oxidizing atmosphere to improve effective function over a long period of time and prevent contamination **(paragraph 47 lines 3-6),** suppressing the gaseous diffusion in a screen-display field as much as possible, maintaining a high-vacuum state, and aiming at stabilizing a display **(paragraph 9)**.

Consequently it would have been obvious to a person having ordinary skill in the art at the time the invention was made to not expose a getter film to an oxidizing atmosphere in the FED of Ono et al. since such a modification would improve effective function over a long period of time and prevent contamination, suppressing the gaseous

diffusion in a screen-display field as much as possible, maintaining a high-vacuum state, and aiming at stabilizing a display **(paragraph 9)** as taught by Osamu et al. The examiner notes that the Osamu et al. reference does not need the activation step for the electron emitters. Therefore the Ono et al. and Osamu et al. references in combination do not need the activation step for the electron emitters found in Ono et al.

Regarding claims 2 and 49, Ono et al. teaches a method of manufacturing a flat panel display **(Fig. 1)** including a face plate **(faceplate Fig. 1 ref. 4)** having a first substrate **(glass substrate ref. 6)**, a phosphor layer **(fluorescent film ref. 7)** arranged on the first substrate and having red, green, and blue phosphor dots **(dot-shaped fluorescent bodies Fig. 2B; col. 8 lines 39-43)** separated by a black conductive material **(black electroconductive substance ref. 12)**, and a metal back layer **(metal back Fig. 1ref. 8)** arranged on the phosphor layer, and a rear plate **(rear plate ref. 2)** having a second substrate **(electron source substrate ref. 1)**, electron emitters arranged **(col. 26 lines 5-8)** on the second substrate corresponding to the phosphor dots, a gap **(Fig. 1 no ref. #)** between the face plate and the rear plate is maintained a vacuum atmosphere, the method comprising a getter film **(getter layer ref. 9; col. 8 lines 56-59; vacuum deposition; Ti is a known evaporable getter)**, but fails to teach heating the faceplate in a vacuum atmosphere to deaerate the faceplate; cooling the faceplate in a vacuum atmosphere; disposing a getter device in a position facing the metal back layer of the face plate and depositing a getter film made of evaporable getter material on the metal back layer without exposing the getter film to an oxidizing atmosphere; disposing the faceplate and a rear plate having an electron source formed

on a substrate so as to face each other to form a gap therebetween; and hermetically sealing the gap in a vacuum atmosphere. Osamu et al. in the analogous art teaches heating the faceplate in a vacuum atmosphere to deaerate the faceplate; cooling the faceplate in a vacuum atmosphere **(paragraphs 14, 29 and 30)**; disposing a getter device in a position facing the metal back layer of the face plate and depositing a getter film made of evaporable getter material on the metal back layer without exposing the getter film to an oxidizing atmosphere **(paragraph 47 and 32 10^{-8} Torr)**; disposing the faceplate and a rear plate having an electron source formed on a substrate so as to face each other to form a gap therebetween; and hermetically sealing the gap in a vacuum atmosphere **(paragraph 33)**. Additionally, Osamu et al. teaches incorporation of such a process done in a vacuum to improve the prevention of contamination to the getter material **(paragraph 30),** suppressing the gaseous diffusion in a screen-display field as much as possible, maintaining a high-vacuum state, and aiming at stabilizing a display **(paragraph 9)**.

Consequently it would have been obvious to a person having ordinary skill in the art at the time the invention was made to use the vacuum process in the image display apparatus manufacturing of Ono et al. since such a modification would improve the prevention of contamination to the getter material **(paragraph 30),** suppressing the gaseous diffusion in a screen-display field as much as possible, maintaining a high-vacuum state, and aiming at stabilizing a display **(paragraph 9)** as taught by Osamu et al. The examiner notes that the Osamu et al. reference does not need the activation

step for the electron emitters. Therefore the Ono et al. and Osamu et al. references in combination do not need the activation step for the electron emitters found in Ono et al.

Regarding claims 3 and 41, Ono et al. teaches the method of manufacturing the flat panel display as set forth in claim 1 wherein the getter film is substantially made of Ba **(col. 12 lines 19-22)**.

Regarding claims 4 and 42, Ono et al. teaches the method of manufacturing the flat panel display as set forth in claim 1 wherein the metal back layer is substantially made of aluminum **(metal back of thin Al film ref. 8)**.

Regarding claims 5 and 43, Ono et al. and Osamu et al. teach all the limitations of claims 5 and 43, but fail to teach preceding depositing the getter film, heating/deaerating the faceplate. Osamu et al. in the analogous art teaches preceding depositing the getter film, heating/deaerating the faceplate **(paragraphs 14, 29 and 30)**. Additionally, Osamu et al. teaches incorporation of such a heating/deaerating of the faceplate to improve the prevention of contamination to the getter material **(paragraph 30),** suppressing the gaseous diffusion in a screen-display field as much as possible, maintaining a high-vacuum state, and aiming at stabilizing a display **(paragraph 9)**.

Consequently it would have been obvious to a person having ordinary skill in the art at the time the invention was made to heat and deaerate the faceplate preceding depositing the getter film in the of image display of Ono et al. since such a modification would improve the prevention of contamination to the getter material, suppresses the gaseous diffusion in a screen-display field as much as possible, maintains a high-vacuum state, and aims at stabilizing a display as taught by Osamu et al.

Regarding claims 6 and 44, Ono et al. and Osamu et al. teach all the limitations of claims 6 and 44, but fail to teach preceding hermetically sealing, heating/deaerating the faceplate. Osamu in the analogous art teaches preceding hermetically sealing, heating/deaerating the faceplate **(paragraph 31 and 32)**. Additionally, Osamu et al. teaches incorporation of such a heating/deaerating preceding hermetically sealing to improve suppressing the gaseous diffusion in a screen-display field as much as possible, maintaining a high-vacuum state, and aiming at stabilizing a display **(paragraph 9)**.

Consequently it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have preceding hermetically sealing, heating/deaerating the faceplate in the image display process of Ono et al. and Osamu et al. since such a modification would improve suppressing the gaseous diffusion in a screen-display field as much as possible, maintaining a high-vacuum state, and aiming at stabilizing a display as taught by Osamu et al.

Regarding claims 8 and 45, Ono et al. and Osamu et al. teaches all the limitations of claims 8 and 45, but fails to teach wherein the respective processes are implemented in a same manufacturing apparatus continuously or simultaneously. Osamu et al. in the analogous art teaches wherein the respective processes are implemented in a same manufacturing apparatus continuously or simultaneously **(paragraphs 33 and 34)**. Additionally, Osamu teaches incorporation of such a device to improve purity of the getter **(paragraph 33)**.

Consequently it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have wherein the respective processes are implemented in a same manufacturing apparatus continuously or simultaneously in the processing of the image display apparatus of Ono et al. since such a modification would improve purity of the getter as taught by Osamu et al.

Regarding claims 9 and 46, Ono et al. and Osamu et al. teach all the limitations of claims 9 and 46, but fails to teach wherein the respective processes are implemented in manufacturing apparatuses independent for the respective processes continuously or simultaneously. Osamu in the analogous art teaches wherein the respective processes are implemented in manufacturing apparatuses independent for the respective processes continuously or simultaneously **(paragraph 33 and 34; conveyance means)**. Additionally, Osamu et al. teaches incorporation of such an implementation of respective processes to improve the manufacture of FEDs **(paragraph 34)**.

Consequently it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have wherein the respective processes are implemented in manufacturing apparatuses independent for the respective processes continuously or simultaneously in the of manufacturing of the image display apparatus of Ono et al. since such a modification would improve the manufacture of FEDs as taught by Osamu et al.

Regarding claim 10, Ono et al. teaches the method of manufacturing the flat panel display as set forth in claim 1, wherein the phosphor layer has phosphor dots **(dot-shaped fluorescent bodies ref. 13)** separated by a black conductive material **(black electroconductive substance ref. 12)**.

Regarding claim 11, Ono et al. teaches the method of manufacturing the flat panel display as set forth in claim 1, wherein the method of manufacturing the flat panel display as set forth in claim 10 wherein the getter film is mainly deposited on a region corresponding to the black conductive material **(col. 7 lines 41-53)**.

Regarding claim 12, Ono et al. teaches the method of manufacturing the flat panel display as set forth in claim 1: wherein the getter film is deposited on almost the entire image display region of the faceplate.

Regarding claims 13 and 47, Ono et al. teaches the method of manufacturing the flat panel display as set forth in claim 1: wherein the getter film is deposited mainly in a region other than a region where the phosphor layer is formed **(col. 8 lines 44-54)**.

Regarding claim 15, Ono et al. teaches the method of manufacturing the flat panel display as set forth in claim 1: wherein in the hermetic sealing, a support frame is disposed between the faceplate and the rear plate, the gap being hermetically **(col. 17 line 37)** sealed through the support frame **(support frame ref. 3)**.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ono et al. U.S. Patent 5,936,342 in view of Osamu et al. Japanese Patent Application Publicaton 08-022785 and Watkins et al. U.S. Patent 5,827,102.

Regarding claim 16, Ono and Osamu et al. teach all the limitations of claim 16, but fail to teach hermetically sealed by indium or an alloy thereof. Watkins et al. in the analogous art teach hermetically sealed by indium or an alloy thereof **(abstract; col. 7 line 3)**. Additionally, Watkins teaches incorporation of such an indium seal to improve the structure by providing a good working seal having a low melting point for field emission displays **(abstract)**.

Consequently it would have been obvious to a person having ordinary skill in the art at the time the invention was made to use the hermetically sealed indium or an alloy thereof in support frame and faceplate of Ono et al. since such a modification would improve the structure by providing a good working seal having a low melting point for field emission displays as taught by Watkins et al.

Regarding claims 37 and 38, Ono et al. teaches the method of manufacturing the flat panel display as set forth in claim 1: wherein the getter film is deposited on a region corresponding to the phosphor layer **(col. 8 lines 58-59; col. 7 lines 41-47)** of the face plate. The getter film is over the entire aluminum film so it is over the phosphor layer areas.

Regarding claims 39 and 40, Ono et al. teaches the method of manufacturing the flat panel display as set forth in claim 1: wherein the metal back layer has a thickness of 2500 nm or less **(claim 2 col. 26 lines 46-48)**.

Claims 1, 3, 4, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones U.S. Patent 5,529,524 in view of Osamu et al. Japanese Patent Application Publicaton 08-022785.

Regarding claims 1, 3, 4, and 18, Jones et al. teaches a method of manufacturing a flat panel display comprising: depositing a metal back layer **(aluminum coating Fig. 118 ref. 284)** on a faceplate **(Fig. 118 no ref. #)** having a phosphor layer **(phosphor ref. 282)** formed on a substrate **(glass plate ref. 280)**; depositing a getter film made of evaporable getter material **(col. 25 lines 19-23; Barium)** on the metal back layer on the phosphor layer disposing the faceplate thereon the getter film is deposited and a rear plate **(Fig. 106 no ref. #)** having an electron source **(series of emitters ref. 210)** formed on a substrate **(glass bottom plate ref. 206)** so as to face to each other to form a gap therebetween, and hermetically sealing the gap **(col. 13 lines 56-67; col. 14 lines 1-5)**, but fails to teach without exposing the getter film to an oxidizing atmosphere. Osamu et al. in the analogous art teaches without exposing the getter film to an oxidizing atmosphere **(paragraph 47 and 32 10^{-7} torr)**. Additionally, Osamu et al. teaches incorporation of such an atmosphere to improve effective function over a long period of time and prevent contamination **(paragraph 47 lines 3-6),** suppressing the gaseous diffusion in a screen-display field as much as possible, maintaining a high-vacuum state, and aiming at stabilizing a display **(paragraph 9)**.

Consequently it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have without exposing the getter film to an oxidizing atmosphere in the flat panel display of Jones since such a modification would improve effective function over a long period of time and prevent contamination, suppressing the gaseous diffusion in a screen-display field as much as possible,

maintaining a high-vacuum state, and aiming at stabilizing a display as taught by Osamu et al.

Allowable Subject Matter

Claims 14 and 48 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 14, the following is an examiner's statement of reasons for allowance: The prior art of record neither shows nor suggests a flat panel display including the combination of all the limitations as set forth in claim 14, and specifically wherein the getter film has a thickness of 1 micrometer or more could not be found elsewhere in prior art.

Regarding claim 48, the following is an examiner's statement of reasons for allowance: The prior art of record neither shows nor suggests a flat panel display including the combination of all the limitations as set forth in claim 48, and specifically wherein the getter film has a thickness of 1 micrometer or more could not be found elsewhere in prior art.

Response to Arguments

Applicant's arguments with respect to claims 1-6, 8-16 and 18 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

The Jones reference used above U.S. Patent 5,529,524 discloses that the getter material titanium is evaporable **(col. 17 lines 56-59)**. Japanese to English translations

of Japanese Patent Publication(s) was done at the following website

http://www19.ipdl.jpo.go.jp/PA1/cgi-bin/PA1INDEX .

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Glenn Zimmerman whose telephone number is (703) 308-8991. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (703) 305-4794. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7382 for regular communications and (703) 308-7382 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is n/a.

Glenn Zimmerman
July 31, 2003

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PRIMARY EXAMINER